Supplementary Materials For The Four Faces of Political Participation in Argentina: Using Latent Class Analysis To Study Political Behavior

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May 11, 2017

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Supplementary Materials

A Turnout by Province and Municipalities in Buenos Aires Province

We claim that the introduction of reforms to the enforcement of mandatory voting by Ley 26.744 in 2012 did not have a significant effect in voter turnout, and therefore it is unlikely to have had an effect in the participation decision for other activities considered in this paper. The new law updated the fines for failing to vote without a valid excuse, and more importantly, a second new law (Ley 26.774) mandated the creation of a registry of offenders.[1] Given that the law made it more costly to not vote, and made it significantly more likely for a non-voter to be caught, the reform should have a non-negative effect on turnout.

As we mentioned in the introduction, aggregate voter turnout in the closest Presidential election prior to the reform, that of 2011, reached 80.2%. In the first Presidential election after the reform, in 2015, voter turnout was 81.1% during a very contested election. While it is not possible to make accurate inferences of the effect of the reform in voter turnout, the fact that aggregate turnout only barely increased points to, at best, a quantitatively negligible positive effect. This small increase becomes even less important once we consider that turnout has had an upward trend since the turn of the century.

To provide a more disaggregated picture, Figure A1 shows how turnout changed between the last three Presidential elections at the province level. While turnout generally increased between the 2011 and 2015 Presidential election in most provinces, this increment was smaller than that observed between the 2007 and 2011 elections. This supports our argument that turnout increase is unlikely to be related to changes in the calculus of voting introduced by the improved enforcement of mandatory voting, but is instead related to a more general upward trend in turnout observed since before the reform.[2]

Figure A2 shows the change in turnout for Presidential elections in all the municipalities of Buenos Aires province.[3] It is important to note that municipalities in Buenos Aires province are very heterogeneous, including the high-income municipalities in the northern suburbs of the City of Buenos

[1] The lack of a registry of offenders prior to the reform effectively meant that the mandatory voting provision was generally not enforced. The registry law is Ley 26.774 de Ciudadanía Argentina, Congreso de la Nación Argentina, 2012.

[2] The most significant outlier in terms of turnout growth is Santiago del Estero province. This province had unusually low turnout in the early 2000s, as low as 55%, and has shown a steady increase since then, converging to the national average.

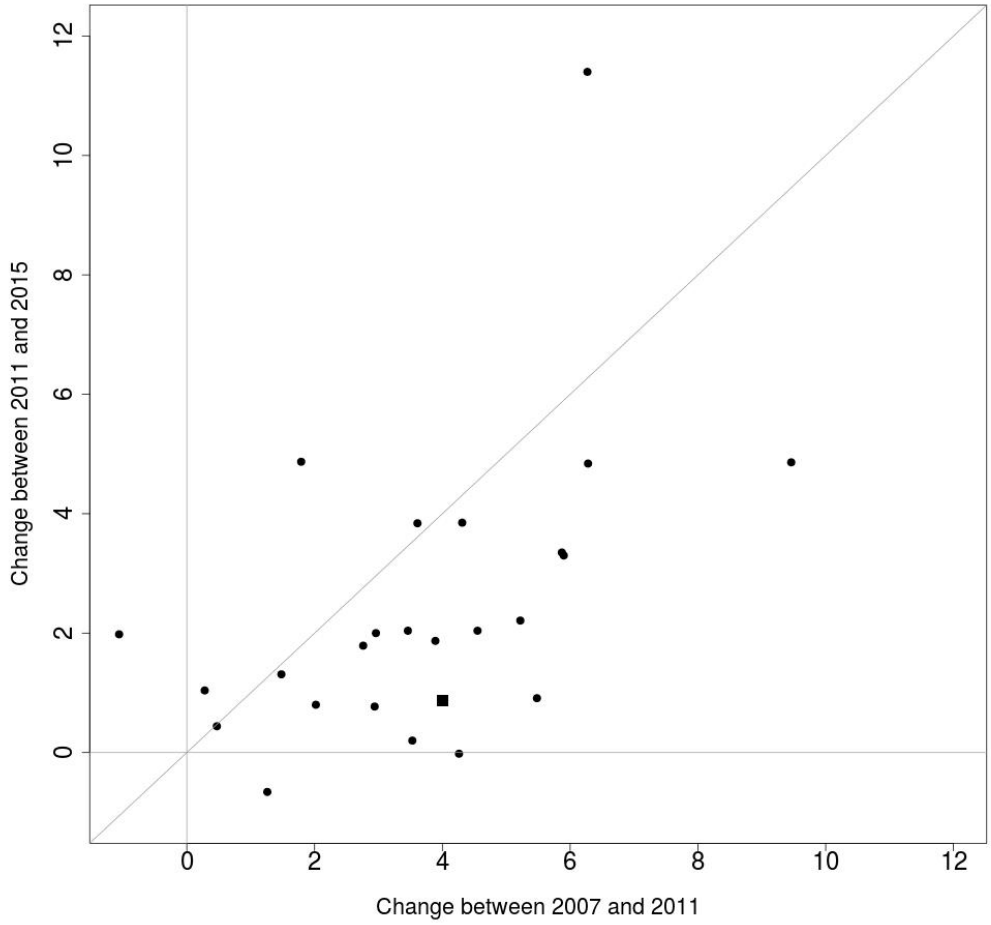
[3] Data for Lezama *Partido* was added to the data from Chascomús *Partido*, from which it seceded in 2009.

Aires, as well as poverty stricken ones in the western and southern portions of that metropolitan area. It also includes medium sized industrial cities, and many agriculture-dependent small municipalities. As with the data on a provincial level, turnout increased in most municipalities between the Presidential elections of 2007 and 2011 (both before the reform). The evolution of turnout between the 2011 and 2015 Presidential elections shows that in most municipalities where turnout increased, it was less than the increase in previous elections. Moreover, in about half of the municipalities turnout actually dropped.[4]

Determining the effects of the enhanced enforcement of mandatory voting on turnout is hard to do, especially since the reform affected the entire country. This is also beyond the scope of this paper. But the turnout statistics presented here show that it is very unlikely that the reform had a quantitatively important effect in the calculus of voting and thus in turnout. Moreover, this implies that second-order effects on participatory decisions for other political activities are likely to be negligible.

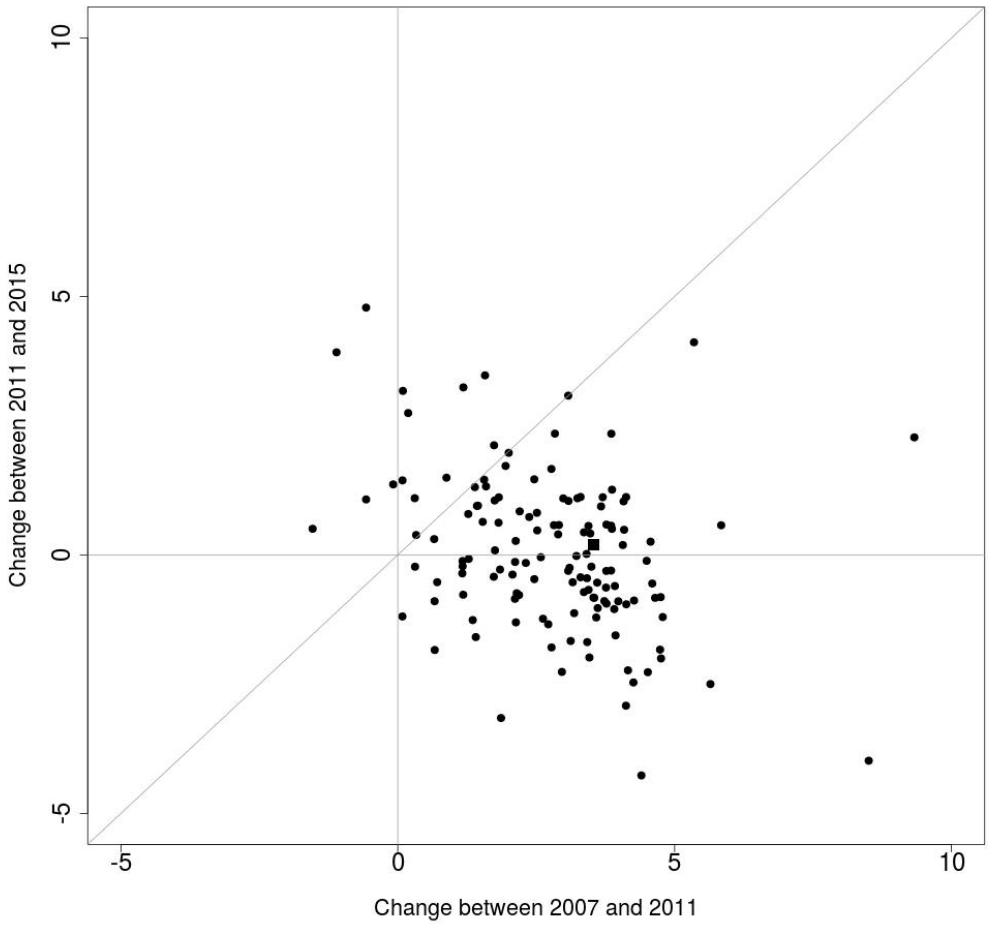
[4]The data actually suggests a mean-reverting process, in which municipalities with the highest increases in turnout prior to the reform are the ones with the highest decreases in turnout after the reform.

Figure A1: Changes in Turnout by Province



Note: Black dots represent changes in provincial turnout. The black square represents the change in national turnout

Figure A2: Changes in Turnout by Municipality in Buenos Aires Province



Note: Black dots represent changes in municipal turnout. The black square represents the change in provincial turnout

B Estimation

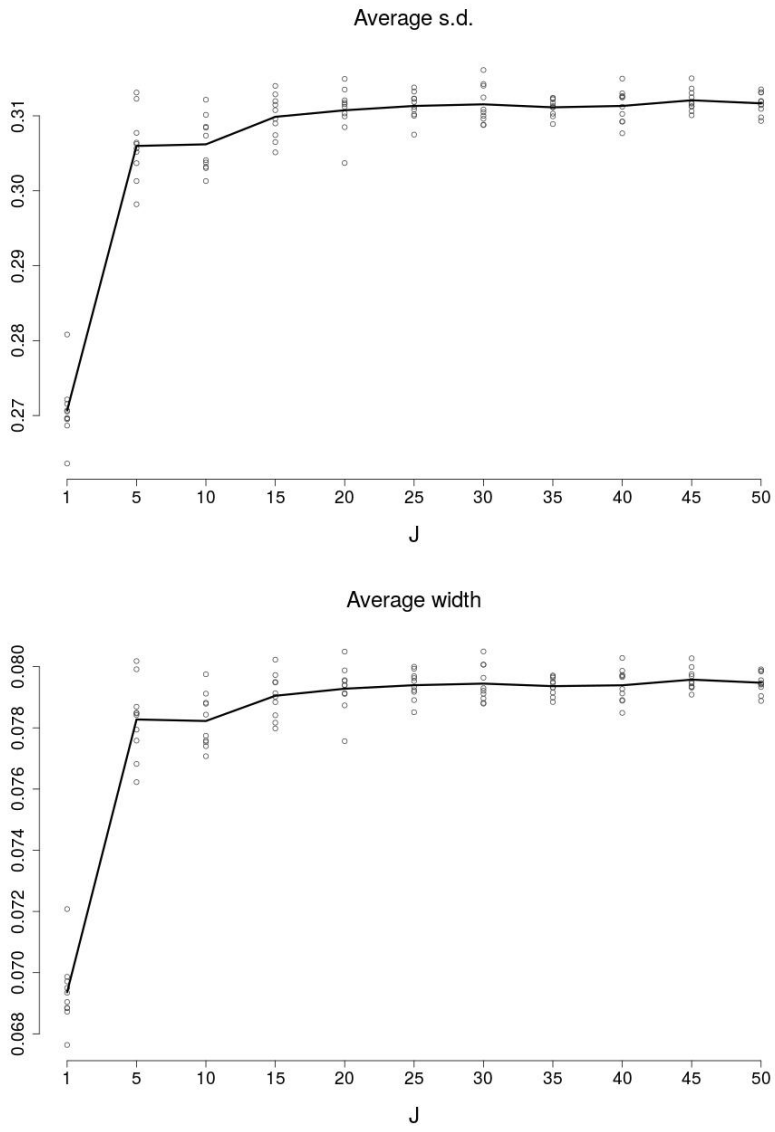
Our data analysis was conducted in two stages. In the first stage, we estimated a latent class model for classification. In the second stage, we estimated a multinomial logit model to explain first stage assignment into participatory types. Since the dependent variable in our second stage model is an estimated quantity, we took steps to incorporate first stage classification uncertainty into our second stage estimates. Doing so involved: (1) estimating the first stage model and drawing J samples from the posterior distribution of participatory types, (2) repeatedly estimating the second stage model for each of these J draws, and (3) combining the results of these J estimations.

To find the optimal J, we estimated the second stage model 1,000 times, and repeatedly selected random subsets from these estimations to simulate the results for different J (1, 5, 10, 15, 20, 25, and so on, up to 50). The selection of random subsets of estimations was repeated ten times for each J. We calculated the following quantities for each repetition and each J: (a) the average standard deviation of beta coefficients, and (b) the average width of credible intervals corresponding to beta coefficients. Figure B1 shows the relationship between these two measures of overall dispersion and J. The smooth line depicts average results for each J.

[FIGURE B1 ABOUT HERE]

The results depicted in Figure B1 suggest that uncertainty estimates increase sharply up to a certain point (between J = 5 and J = 15) and then stabilize. A relatively small J (around 30 estimations of the second stage model) are enough to fully account for the influence of classification uncertainty on the dispersion of parameter estimates. Further increasing J beyond that point (that is, estimating the second stage model a larger number of times) has no impact on standard deviations of model coefficients or the width of credible intervals. Accordingly, the results reported in the paper were calculated by combining the results obtained by repeatedly estimating the second stage model 30 times.

Figure B1: Relationship Between J and Measures of Dispersion



Note: In the upper (lower) panel, circles indicate the average standard deviation (width of credible intervals) of estimated coefficients over J estimations of the multinomial logit model. For each J, the smooth line indicates the average standard deviation (width of credible intervals) calculated over all sets of repeated estimations.

C Marginal Effects

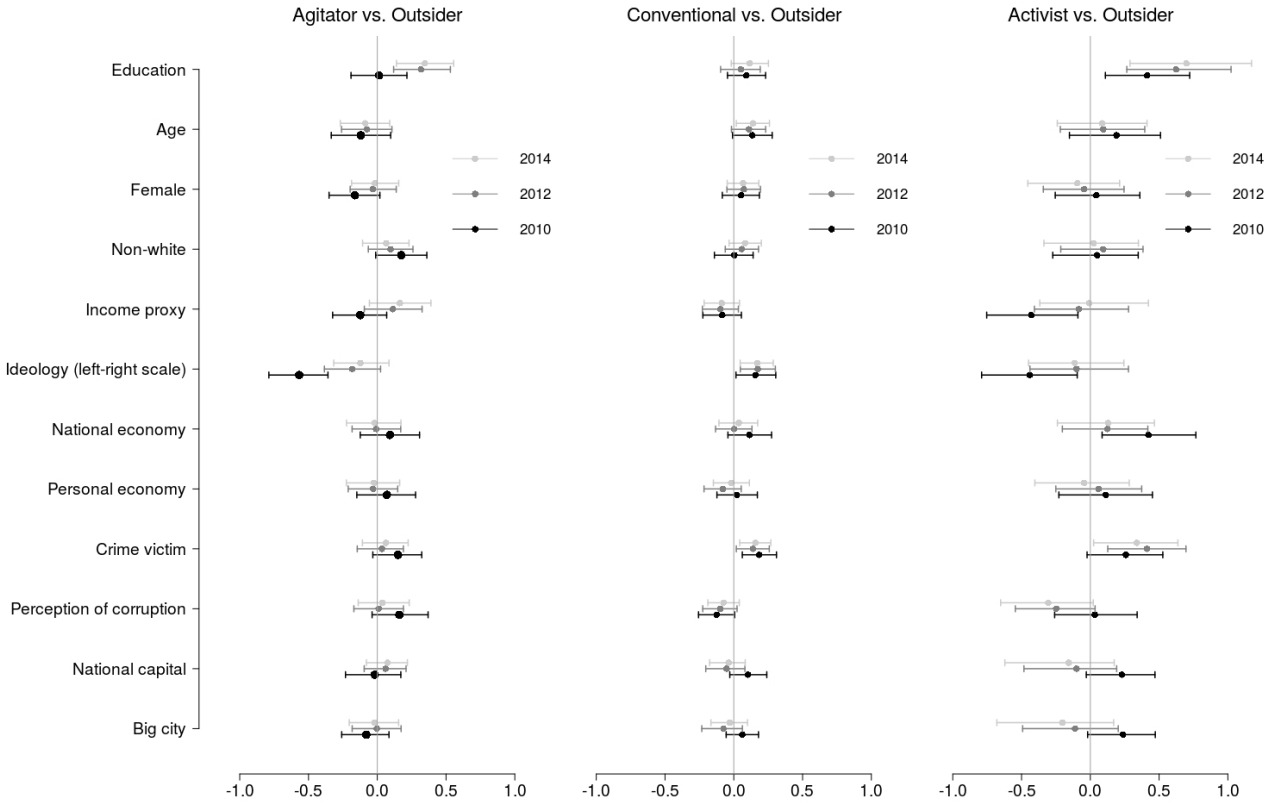
Table C1: Changes in Assignment Probability

	Voter Participation Types											
	Outsiders			Agitators			Conventionals			Activists		
	Mean	2.5%	97.5%	Mean	2.5%	97.5%	Mean	2.5%	97.5%	Mean	2.5%	97.5%
Baseline probability	65.6	59.2	71.5	9.2	5.7	13.4	18.8	14.2	23.9	6.4	2.9	11.7
Education (11 to 13 on 0-18 scale)	-2.3	-3.6	-1.2	0.5	-0.1	1.4	0.3	-0.6	1.1	1.5	0.5	3.1
Age (37 to 53 years old)	-1.8	-3.8	0.0	-1.1	-2.1	-0.1	2.3	0.7	4.0	0.6	-0.7	2.4
Male to female	-0.9	-4.4	2.6	-1.3	-3.3	0.7	2.3	-0.6	5.2	-0.1	-2.8	2.6
White to non-white	-4.2	-8.1	-0.4	1.8	-0.6	4.5	1.7	-1.4	5.1	0.7	-2.2	4.2
Income proxy (9 to 11 on 0-14 scale)	1.3	-0.1	2.8	0.3	-0.5	1.3	-0.8	-1.9	0.3	-0.9	-2.1	0.1
Ideology (5 to 7 along 1-10 scale)	0.2	-1.9	2.2	-2.3	-3.7	-1.2	3.5	1.9	5.3	-1.3	-3.1	-0.0
National economy (better to worse)	3.7	-1.8	9.3	0.2	-3.2	3.8	-0.9	-5.1	3.5	-3.0	-7.1	0.0
Personal economy (better to worse)	0.2	-5.2	5.4	-0.2	-3.5	3.4	1.1	-3.0	5.5	-1.1	-4.8	2.9
Crime victim (no to yes)	-10.4	-15.1	-6.0	0.8	-1.4	3.5	4.5	0.9	8.6	5.0	1.0	11.1
Corruption (a little to very)	2.6	-2.2	7.5	3.0	-0.7	6.7	-3.8	-7.7	-0.2	-1.8	-5.7	1.3
National capital (no to yes)	-3.2	-9.9	3.3	1.7	-2.0	5.9	0.1	-5.0	5.4	1.3	-3.1	6.7
Big city (no to yes)	0.1	-5.1	5.3	-1.0	-3.8	1.9	-0.8	-4.7	3.3	1.7	-2.0	6.5
Year 2010 to 2012	8.5	4.3	13.1	-3.1	-5.9	-0.7	-2.1	-5.8	1.4	-3.3	-7.2	-0.8
Year 2010 to 2014	7.9	3.7	12.2	-2.5	-5.1	-0.0	-2.0	-5.6	1.5	-3.4	-7.1	-0.9

Note: The table provides means and 95% credible intervals for the effect of marginal changes in explanatory and control variables included in the second-stage multinomial logit model.

D Model with Random Effects by Year

Figure D1: Determinants of Assignment into Participatory Types



Note: The plot depicts posterior means and 95% credible intervals for the coefficients of a second-stage multinomial logit model where coefficients were allowed to vary by survey year.

Table D1: Changes in Assignment Probability by Year

	Voter Participation Types											
	Outsiders			Agitators			Conventionals			Activists		
Year 2010	Mean	2.5%	97.5%	Mean	2.5%	97.5%	Mean	2.5%	97.5%	Mean	2.5%	97.5%
Baseline probability	64.0	54.4	72.5	9.3	4.6	16.1	21.8	14.6	31.3	5.0	1.6	11.2
Education (11 to 13 on 0-18 scale)	-1.4	-3.0	0.0	-0.1	-1.0	0.8	0.5	-0.7	1.9	1.0	0.1	2.7
Age (37 to 53 years old)	-1.9	-4.9	0.9	-1.2	-3.0	0.4	2.3	-0.2	5.1	0.9	-0.7	3.3
Male to female	-0.2	-5.5	5.0	-2.6	-6.1	0.0	2.3	-2.5	7.3	0.4	-2.7	4.0
White to non-white	-3.0	-8.7	2.8	3.5	-0.3	8.5	-0.8	-6.0	4.3	0.3	-3.2	3.9
Income proxy (9 to 11 on 0-14 scale)	2.2	0.2	4.3	-0.5	-1.8	0.7	-0.6	-2.4	1.2	-1.2	-2.9	-0.1
Ideology (5 to 7 along 1-10 scale)	1.4	-2.1	5.0	-3.9	-6.8	-1.8	4.1	1.5	7.2	-1.6	-4.3	-0.3
National economy (better to worse)	8.3	0.4	16.6	-1.2	-6.4	3.7	-3.9	-11.7	3.0	-3.2	-8.4	-0.3
Personal economy (better to worse)	2.6	-5.2	10.4	-1.2	-6.0	4.1	-0.5	-7.5	6.5	-1.0	-5.6	3.6
Crime victim (no to yes)	-10.7	-16.8	-4.8	1.8	-2.0	6.8	6.2	0.5	12.9	2.7	-1.0	8.9
Corruption (a little to very)	0.7	-6.8	8.4	5.3	-0.4	11.8	-6.3	-13.2	-0.6	0.4	-4.3	4.7
National capital (no to yes)	-9.0	-19.0	0.7	-1.6	-7.3	4.1	5.5	-3.3	16.0	5.0	-0.9	15.1
Big city (no to yes)	-4.4	-11.8	2.4	-2.3	-6.3	1.4	2.5	-3.4	9.4	4.2	-0.4	12.0
Year 2012	Mean	2.5%	97.5%	Mean	2.5%	97.5%	Mean	2.5%	97.5%	Mean	2.5%	97.5%
Baseline probability	74.2	67.9	80.0	6.6	3.9	10.2	16.0	11.0	22.1	3.2	1.1	6.4
Education (11 to 13 on 0-18 scale)	-2.0	-3.5	-0.7	1.0	0.2	2.0	-0.0	-1.0	1.0	1.1	0.2	2.6
Age (37 to 53 years old)	-1.2	-3.3	0.7	-0.5	-1.6	0.5	1.5	-0.2	3.3	0.3	-0.6	1.6
Male to female	-1.3	-5.2	2.4	-0.5	-2.6	1.5	2.2	-1.3	5.7	-0.3	-2.2	1.4
White to non-white	-3.1	-7.1	0.9	1.2	-1.1	3.8	1.3	-2.2	5.1	0.6	-1.6	3.0
Income proxy (9 to 11 on 0-14 scale)	0.5	-1.1	2.1	0.6	-0.3	1.8	-1.0	-2.3	0.3	-0.2	-1.0	0.7
Ideology (5 to 7 along 1-10 scale)	-1.2	-3.4	1.0	-1.2	-2.4	-0.0	2.7	0.8	4.7	-0.3	-1.4	0.8
National economy (better to worse)	0.5	-5.5	6.0	0.3	-2.8	3.7	0.0	-4.9	5.3	-0.9	-3.5	1.7
Personal economy (better to worse)	-3.1	-9.5	2.8	0.4	-2.7	4.0	3.2	-2.1	9.2	-0.5	-2.9	2.2
Crime victim (no to yes)	-8.0	-13.9	-2.8	-0.1	-2.5	2.5	3.8	-0.4	8.5	4.3	0.7	10.3
Corruption (a little to very)	4.2	-0.8	9.7	0.5	-2.8	3.8	-3.3	-8.1	1.0	-1.5	-4.2	0.3
National capital (no to yes)	1.0	-6.2	8.0	1.9	-1.7	7.0	-2.3	-8.4	4.0	-0.6	-3.3	2.9
Big city (no to yes)	2.6	-3.5	8.3	0.3	-2.6	4.1	-2.4	-7.3	2.6	-0.5	-2.9	2.6
Year 2014	Mean	2.5%	97.5%	Mean	2.5%	97.5%	Mean	2.5%	97.5%	Mean	2.5%	97.5%
Baseline probability	73.4	66.4	80.0	6.1	3.0	10.2	17.2	11.7	23.8	3.4	1.0	7.6
Education (11 to 13 on 0-18 scale)	-2.6	-4.4	-1.1	0.9	0.2	1.9	0.4	-0.6	1.5	1.3	0.2	3.4
Age (37 to 53 years old)	-1.7	-3.8	0.3	-0.6	-1.6	0.3	2.0	0.2	4.0	0.3	-0.7	1.8
Male to female	-1.2	-5.1	2.7	-0.3	-2.4	1.6	2.1	-1.3	5.6	-0.6	-3.0	1.3
White to non-white	-3.1	-7.3	1.1	0.6	-1.6	2.9	2.4	-1.3	6.3	0.1	-2.5	2.8
Income proxy (9 to 11 on 0-14 scale)	0.2	-1.5	1.9	0.8	-0.2	2.0	-1.0	-2.4	0.3	-0.0	-1.0	1.1
Ideology (5 to 7 along 1-10 scale)	-1.5	-3.7	0.7	-0.8	-2.1	0.3	2.7	0.8	4.6	-0.4	-1.7	0.8
National economy (better to worse)	1.7	-4.7	7.9	0.5	-2.6	4.1	-1.3	-6.9	4.3	-1.0	-4.4	1.8
Personal economy (better to worse)	-1.5	-8.1	4.5	0.3	-2.7	4.0	0.6	-4.7	6.1	0.5	-2.6	5.3
Crime victim (no to yes)	-8.3	-14.2	-3.1	0.2	-2.0	2.8	4.8	0.5	9.7	3.3	-0.1	9.6
Corruption (a little to very)	3.5	-1.7	8.9	0.9	-2.2	4.2	-2.6	-7.1	1.6	-1.8	-5.4	0.2
National capital (no to yes)	0.7	-6.4	7.5	2.1	-1.3	6.9	-1.8	-7.6	4.5	-1.1	-4.5	2.4
Big city (no to yes)	1.9	-4.2	7.6	-0.0	-2.8	3.4	-0.7	-5.7	4.7	-1.1	-4.5	2.0

Note: The table provides means and 95% credible intervals for the effect of marginal changes in explanatory and control variables included in a multinomial logit model where coefficients were allowed to vary by survey year.